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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/666,156	09/19/2003	Reed Carver	Orb-008	7094
7590	02/24/2005		EXAMINER	
Brian Kolkowski Orbital Research Inc. 4415 Euclid Avenue Cleveland, OH 44103			JACKSON, ANDRE K	
			ART UNIT	PAPER NUMBER
			2856	

DATE MAILED: 02/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>
	10/666,156	CARVER ET AL.
	<b>Examiner</b>	<b>Art Unit</b>
	André K. Jackson	2856

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on \_\_\_\_.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-20 is/are pending in the application.
  - 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_ is/are allowed.
- 6) Claim(s) 1-12 and 14-19 is/are rejected.
- 7) Claim(s) 13 and 20 is/are objected to.
- 8) Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.
 

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) All    b) Some \* c) None of:
    1. Certified copies of the priority documents have been received.
    2. Certified copies of the priority documents have been received in Application No. \_\_\_\_.
    3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.
- 4) Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: \_\_\_\_.

**DETAILED ACTION**

***Claim Objections***

1. Claims 10,13 and 16 are objected to because of the following informalities:

Regarding claims 10,13 and 16, the claims need a ":" --colon-- after comprising.  
Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 10,12 and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Holmen et al.

Regarding claim 10, Holmen et al. disclose in the patent entitled "Integrated thin-film diaphragm; backside etch" a sensing element and a heating element capable of heating the sensing element to at least about the application temperature of the pressure sensor (Figure 2, Figure 6).

Regarding claim 12, Holmen et al. disclose where the heating element is capable of heating the sensing element to at least about the maximum application temperature of the pressure sensor (Column 5).

Regarding claim 14, Holmen et al. disclose where the heating element heats the sensing element to over 200°C (Column 5).

4. Claims 16-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Fujii et al.

Regarding claim 16, Fujii et al. disclose a substrate with an opening having a maximum cross-sectional dimension of less than about 1 .0 mm; and a flexible diaphragm (Figure 3; Column 11, lines 30-42).

Regarding claim 17, Fujii et al. disclose where the opening in the substrate has a maximum cross-sectional dimension of less than about 0.25 mm (Column 11, lines 30-42).

Regarding claim 18, Fujii et al. disclose where the flexible diaphragm has a thickness of less than 350 µm extending across the opening of the substrate (Column 11, lines 30-42).

#### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-9 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujii et al. in view of Ellis.

Regarding claim 1, Fujii et al. disclose in the patent entitled "Method of fabricating a semiconductor pressure sensor" a substrate (1) with an opening; and a flexible diaphragm held across the opening of the substrate where at temperatures of at least about 200°C (Column 7, line 32). Fujii et al. do not disclose a gage factor of at least about 27 for the sensor. Ellis discloses in the patent entitled "Diffusion barrier materials for thick-film piezoresistors and sensors formed therewith" disclose a gage factor that falls in the range of at least about 27 for the sensor (Claim 20 gage factor greater than 20). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Fujii et al. to include a gage factor of at least about 27 for the sensor. By adding this feature the apparatus would be able to have a gage factor to fit the appropriate sensitivity of the device.

Regarding claim 2, Fujii et al. do not disclose where the pressure sensor has a gage factor of at least about 32. However, Ellis discloses where the pressure sensor has a gage factor, which falls in the range of at least about 32 (Claim 20, gage factor greater than 20). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Fujii et al. to include where the pressure sensor has a gage factor of at least

about 32. By adding this feature the apparatus would be able to have a gage factor to fit the appropriate sensitivity of the device.

Regarding claim 3, Fujii et al. do not disclose where the pressure sensor has a gage factor of at least about 37. However, Ellis discloses where the pressure sensor has a gage factor, which falls in the range of at least about 37 (Claim 20, gage factor greater than 20). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Fujii et al. to include where the pressure sensor has a gage factor of at least about 37. By adding this feature the apparatus would be able to have a gage factor to fit the appropriate sensitivity of the device.

Regarding claim 4, Fujii et al. disclose temperatures of at least about 400°C (Column 7, line 32), but does not disclose the pressure sensor has a gage factor of at least about 22. Fujii et al. do not disclose where the pressure sensor has a gage factor of at least about 22. However, Ellis discloses where the pressure sensor has a gage factor, which falls in the range of at least about 22 (Figure 4). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Fujii et al. to include where the pressure sensor has a gage factor of at least about 22. By adding this feature the apparatus would be able to have a gage factor to fit the appropriate sensitivity of the device.

Regarding claim 5, Fujii et al. do not disclose where the pressure sensor has a gage factor of at least about 30. However, Ellis discloses where the

pressure sensor has a gage factor, which falls in the range of at least about 30 (Claim 20). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Fujii et al. to include where the pressure sensor has a gage factor of at least about 30. By adding this feature the apparatus would be able to have a gage factor to fit the appropriate sensitivity of the device.

Regarding claim 6, Fujii et al. do not disclose where the pressure sensor has a gage factor of at least about 35. However, Ellis discloses where the pressure sensor has a gage factor, which falls in the range of at least about 35 (Claim 20). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Fujii et al. to include where the pressure sensor has a gage factor of at least about 35. By adding this feature the apparatus would be able to have a gage factor to fit the appropriate sensitivity of the device.

Regarding claim 7, Fujii et al. disclose a temperature of at least about 550°C (Column 7, line 31), but not where the pressure sensor has a gage factor of at least about 16. Fujii et al. do not disclose where the pressure sensor has a gage factor of at least about 16. However, Ellis discloses where the pressure sensor has a gage factor, which falls in the range of at least about 16 (Figure 4). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Fujii et al. to include where the pressure sensor has a gage factor of at least about 16. By adding this feature the

apparatus would be able to have a gage factor to fit the appropriate sensitivity of the device.

Regarding claim 8, Fujii et al. do not disclose where the pressure sensor has a gage factor of at least about 25. However, Ellis discloses where the pressure sensor has a gage factor, which falls in the range of at least about 25 (Figure 4). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Fujii et al. to include where the pressure sensor has a gage factor of at least about 25. By adding this feature the apparatus would be able to have a gage factor to fit the appropriate sensitivity of the device.

Regarding claim 9, Fujii et al. do not disclose where the pressure sensor has a gage factor of at least about 35. However, Ellis discloses where the pressure sensor has a gage factor, which falls in the range of at least about 35 (Claim 20). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Fujii et al. to include where the pressure sensor has a gage factor of at least about 35. By adding this feature the apparatus would be able to have a gage factor to fit the appropriate sensitivity of the device.

Regarding claim 19, Fujii et al. do not disclose where the pressure sensor is capable of measuring pressures of greater than 1000 psi without premature failure. However, Ellis discloses that in order to reach pressures more than 1000psi a metal diaphragms must be used (Column 2, lines 2-5). Therefore, it

would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Fujii et al. to include where the pressure sensor is capable of measuring pressures of greater than 1000 psi without premature failure. By adding this feature the apparatus would be able to be used in high-pressure systems.

7. Claims 11and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Holmen et al. in view of Fujii et al.

Regarding claim 11, Holmen et al. do not disclose where the sensing element is a strain gage. However, Fujii et al. disclose where the sensing element is a strain gage (104). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Holmen et al. to include where the sensing element is a strain gage. By adding this feature the apparatus would be able to precisely measure the pressure in the system.

Regarding claim 15, Holmen et al. do not disclose where the strain gage responds to deflection of a diaphragm. However, Fujii et al. disclose where the strain gage responds to deflection of a diaphragm (Column 1, lines 15-17). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Holmen et al. to include where the strain gage responds to deflection of a diaphragm. By adding this feature the apparatus would be able to effectively measure the pressure within the system.

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8. Claims 13 and 20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to André K. Jackson whose telephone number is (703) 305-1522. The examiner can normally be reached on Mon.-Thurs. 7AM-4PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on (703) 305-4705. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

*Hezron S. Williams* \_\_\_\_\_

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A.J.

February 18, 2005